

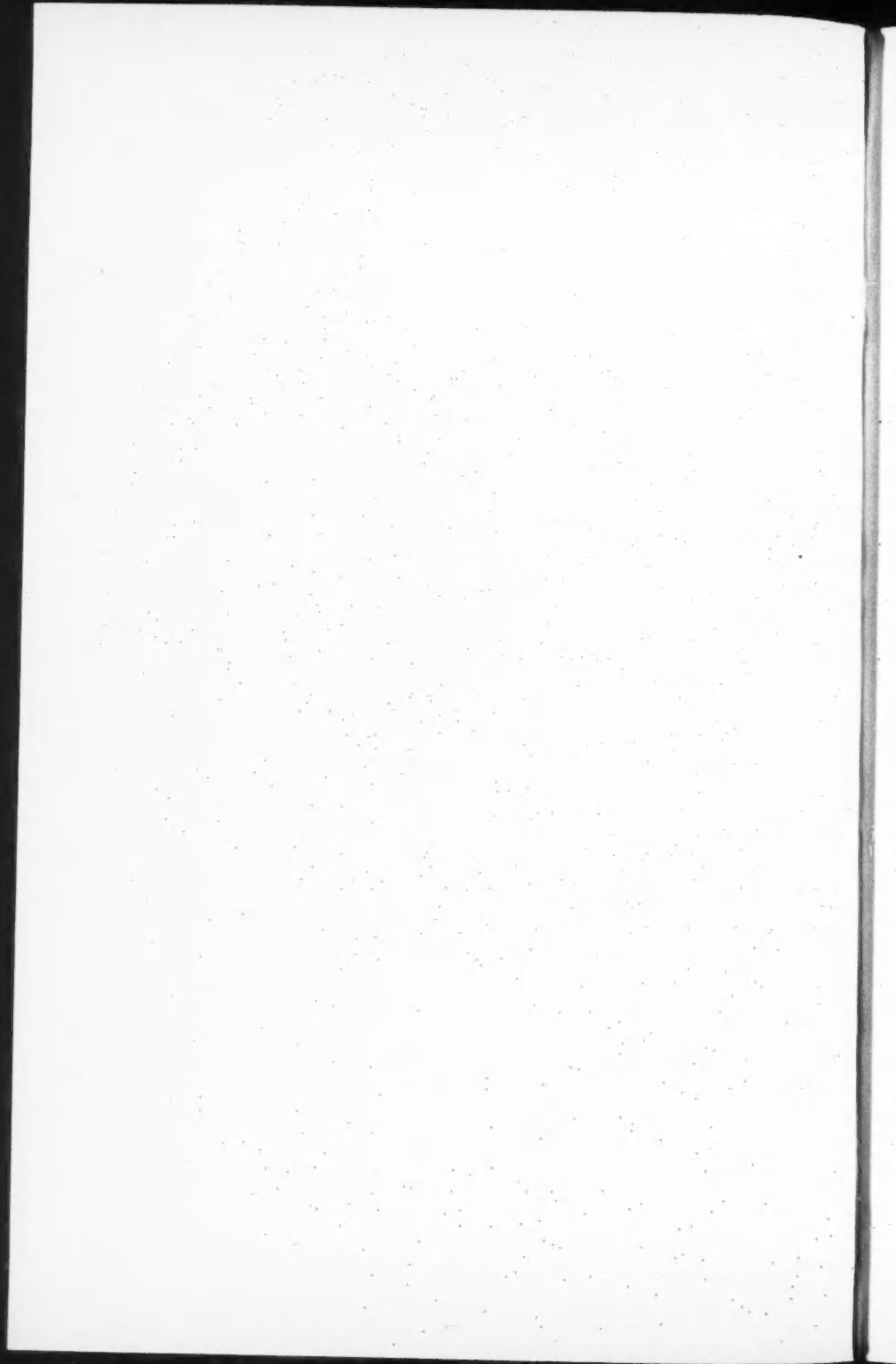
CONTROL OF OUTER SPACE

by

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ASCENT of the satellite Explorer from a Florida cape into outer space, an hour before midnight on Jan. 31, ended a long period of frustration for American scientists and made the United States a pioneer with Soviet Russia of little-known realms beyond the earth. Orbiting of the Explorer also added urgency to the search for answers to two questions: (1) Shall future American ventures into outer space be entrusted to civilian or military authorities, or be divided between the two? and (2) What can be done to avoid conflict between nations over outer space and assure its exploitation to benefit mankind, not to threaten or destroy any people?

Congress gave an interim answer to the first question on Feb. 6 when it sent a bill to the White House authorizing the Secretary of Defense, for a period of one year, to carry out any non-military space projects put in his care by the President. Defense Secretary Neil H. McElroy established an Advance Research Projects Agency the next day and named Roy W. Johnson, a General Electric vice president, to take charge. The new agency is expected to assume responsibility not only for space vehicles, space platforms and related projects, but also for such military undertakings as anti-missile missile projects now in the hands of the Army and Air Force.

The final answer on administration of space projects will require longer deliberation. At the urging of Sen. Lyndon B. Johnson (D-Tex.), majority leader, the Senate on Feb. 6 created a special 13-member committee to consider all aspects of the question and report by June 1 or as soon thereafter as possible.¹ The task of the committee has been

¹The House is expected to set up a corresponding committee. The Senate committee is composed of seven Democrats and six Republicans drawn from standing committees having jurisdiction over various aspects of the problem—Democrats: Johnson, chairman, Anderson (N.M.), Green (R.I.), McClellan (Ark.), Magnuson (Wash.), Russell (Ga.), Symington (Mo.); Republicans: Bricker (Ohio), Bridges (N.H.), Hickenlooper (Iowa), Mundt (S.D.), Saltonstall (Mass.), Wiley (Wis.).

compared to that of a similar special Senate committee which went into the subject of civilian vs. military control of atomic energy and framed the bill which became the Atomic Energy Act of 1946.

In the same way, it will be the duty of the new special committee, after making up its mind as to whether a separate civilian agency or a military agency should have control of space projects, to frame legislative recommendations. The group in carrying out its inquiry will no doubt pay particular attention to proposals of President Eisenhower's scientific adviser, James R. Killian, Jr. Sen. William F. Knowland (R-Calif.) reported, after a White House conference on Feb. 4, that the President had asked Killian to undertake a special study on supervision of space projects and report on "the type of structure we may need to set up in the field of outer space activities—as to where it will be in the over-all structure of the government." Eisenhower indicated at his news conference the following day that he leaned to a division of responsibilities that would leave ballistic missile and other space weapons to the military and put purely scientific space projects in civilian hands. The decision rests ultimately with the two houses of Congress.

U.S.-SOVIET EXCHANGES ON USE OF OUTER SPACE

The urgency of finding an answer to the second question about outer space—What can be done to avoid international conflict and promote ordered regulation in that region?—was underlined by President Eisenhower in a letter on Jan. 12 to Soviet Premier Nikolai A. Bulganin. Taking up what he described as "the most important problem which faces the world today," the President said:

I propose that we agree that outer space should be used only for peaceful purposes. We face a decisive moment in history in relation to this matter. Both the Soviet Union and the United States are now using outer space for the testing of missiles designed for military purposes. The time to stop is now . . .

There are about to be perfected and produced powerful new weapons which, availing of outer space, will greatly increase the capacity of the human race to destroy itself. If indeed it be the view of the Soviet Union that we should not go on producing ever newer types of weapons, can we not stop the production of such weapons which would use, or more accurately misuse, outer space, now for the first time opening up as a field for man's exploration? Should not outer space be dedicated to the peaceful uses of mankind and denied to the purposes of war? That is my proposal.

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Bulganin, replying on Feb. 2, agreed to the importance of using outer space solely for peaceful purposes but said the question could be considered "only as a part of the general problem of banning nuclear and rocket weapons." Because the Soviet premier made an agreement for the peaceful use of outer space conditional on banning of all nuclear weapons and weapons tests and on American relinquishment of foreign bases, the outlook for early action on the President's proposal was discouraging. Eisenhower, in a new letter on Feb. 15, sought again to impress on Bulganin the urgency of seeking to avert the "terrible new menace" in the use of outer space for war purposes.

Sen. Mike Mansfield (D-Mont.) suggested a different approach a week later. Addressing the Senate on Feb. 10, he proposed that the administration try to launch a co-operative international exploration of space comparable to the International Geophysical Year in which Communist and non-Communist nations alike are participating.² "The need of the hour," the senator said, was "for a sharing of the genius, the labor and the cost of the exploration of space."

The number and variety of projects, scientific and military, which are now beckoning space explorers emphasize the importance of establishing a body of rules applying to activities in the areas beyond the earth's atmosphere. Because some of the projects may vitally affect people on earth, an absence of regulations for outer space is likely not only to lead to a chaotic situation but also to produce new factors for discord in the relations between nations.

PATTERN OF AMERICAN RESEARCH ON SPACE FLIGHT

The possibility of reaching the moon has long fired man's imagination. Many space-flight programs envision such an achievement as a culminating astronomical victory and the precursor of manned flights to and beyond the planets. Scientists agree, however, that a great number of basic problems will have to be solved before a manned round-trip flight to the moon can be safely undertaken. Sending an unmanned rocket to or around the moon will be far easier; indeed, this may be the next accomplishment in the penetration of outer space. John P. Hagen, chief of the

² Mansfield said that the President, at the NATO meeting in Paris last December, might well have proposed "extension of the International Geophysical Year . . . into a decade of world-wide scientific cooperation."

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Project Vanguard, declared on Feb. 3 that all that was needed to hit the moon was an official go-ahead and the time necessary to assemble and prepare the "hardware," possibly a year.

Broad lines of an integrated space-flight program for the United States, leading ultimately to a flight of man to the moon and back or to a manned space station, have frequently been suggested. Four separate types of space-flight research, each closely related to the others, are now either under way or contemplated. Two of the research categories involve satellite projects, because satellite development is expected to move for the time being in two directions.

Some satellites will be used to carry into orbit heavier and more complicated instruments than those aboard Explorer—television cameras for scanning meteorological formations and the surface of the earth; equipment for converting solar energy into the power needed to telemeter data to earth; contrivances for emitting recoverable capsules or containers. Other satellites will be sent up with animal passengers and with instruments to measure or observe their reactions. These satellites will enable scientists to study the effects of cosmic radiation, ultra-violet rays, and weightlessness on living creatures in the interests of "space medicine." They will be used also to test the reliability of air-conditioning and pressurizing systems and to help solve the difficult problem of re-entry.

A third type of space-flight research is in the field of extreme distance flight, i.e., flights close to or beyond the moon. At present, research of this kind is concentrated on improving techniques of rocketry, such as launching, fuel, timing, and guidance systems. Experiments with rocket aircraft constitute the fourth type of space-flight research. Speeds in the neighborhood of 4,000 to 5,000 miles an hour and a service ceiling of well over 100 miles have been mentioned for the North American X-15, currently being rushed to completion. Sometimes referred to as man-carrying missiles, such rocket planes will soar far above the point where the atmosphere is able to provide "lift" for conventional jet aircraft.³

³ The X-15 will supply valuable data on the effects upon man of flight in outer space. Important information of that sort was obtained by a test, completed Feb. 16, in which a 23-year-old volunteer at Randolph Air Force Base spent seven days in a three-by-five foot sealed "space capsule" under conditions simulating as closely as possible those that would be experienced in a flight to the moon.

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PLANS AND HOPES FOR U.S. VENTURES INTO SPACE

The X-15 is scheduled for tests in 1959 and, if successful, will carry man more than twice as fast and four times as high as he has previously flown. Additional satellite launchings are planned by the armed services this year. Maj. Gen. Bernard A. Schriever, chief of the Air Force Ballistic Missile Division, told the Senate Preparedness Subcommittee on Jan. 9 that the Air Force hoped to put a satellite into orbit by October 1958, a military reconnaissance satellite (Big Brother) with a recoverable capsule by the spring of 1959, and later a 2,000-pound seeing-eye satellite (Pied Piper). The Army, it was reported on Feb. 4, is seeking permission to put into orbit before the close of the year two reconnaissance satellites, weighing from 300 to 700 pounds, equipped with television and electronic devices to scan the earth.

More ambitious projects, such as sending a rocket to the moon or placing a manned vehicle in orbit around the earth, will depend to a considerable extent on how much money and effort the country is willing to devote to the tasks. There have been hints that if early tests of the X-15 are successful, it may be modified to become the first vehicle to carry a man into orbit around the globe. The top astronautical engineer for the Convair Division of General Dynamics, Kraft A. Ericke, predicted recently that by 1961 or 1962 a small, experimental manned satellite could be launched and the man retrieved alive. Other scientists have put the time when a man could be landed on the moon at anywhere from five years to the end of the century.

When the United States will be able to establish a giant manned space station has brought estimates ranging from 10 to 20 years. The most notable space platform concept, Wernher von Braun's pinwheel space station, calls for an object built in the shape of an enormous wheel that would rotate slowly around its axis, accommodate a crew of 200 or 300 men, and orbit the earth at a speed of more than 18,000 miles an hour and at a height of more than 1,000 miles. Von Braun estimated almost three years ago that such a station could be built in "maybe 15 years."

The possibilities for exploiting space flight and the knowledge gained from it for military or peaceful purposes acquire spectacular dimensions when linked with nuclear

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power. Atomic Energy Commission spokesmen told a subcommittee of the congressional Joint Committee on Atomic Energy, Feb. 6, that nuclear energy offered almost unlimited potentialities for space propulsion. A.E.C. is working on several nuclear rocket projects and on a reconnaissance satellite (Project Snap).

Suggested military uses for satellites, in addition to reconnaissance, include service as stations for launching nuclear weapons, jamming enemy communications, and guiding ballistic missiles to targets. Brig. Gen. Homer A. Boushey, deputy director of Air Force research and development, said on Jan. 28 that the moon would provide a "retaliation base of unequaled advantage" for raining "sure and massive destruction" on earth.

Edward Teller testified before the Senate Preparedness Subcommittee last Nov. 25 that the United States might be reduced to a second class power, without defeat in war, if the Soviet Union acquired the ability to control weather and climate ahead of this country. By bringing on precipitation over vast areas of Russia, Soviet scientists might deprive the North American continent of needed moisture.

WEATHER CONTROL AND OTHER POSSIBLE BENEFITS

If peaceful exploitation of outer space could be assured, there would be nothing to fear from the possibility of controlling weather and climate. On the contrary, large savings in life and property could be anticipated. This would be true even if the course of the weather could not actually be influenced, for it is believed that unmanned weather observatories in outer space would make it possible to forecast the weather accurately for days or weeks in advance.

Joseph Kaplan, chairman of the U.S. National Committee for the International Geophysical Year, wrote recently that man-made satellites "symbolize one of history's boldest exploratory adventures—and promise to bring before long benefits to be felt throughout the world."⁴ The Explorer has been transmitting data on cosmic radiation, density of micrometeorites, and temperatures, and reports indicate that the hazards to man in the nearer reaches of outer space are not as great as many scientists had believed. Other pioneer satellites are expected to give valuable information

⁴ Joseph Kaplan, "How Man-Made Satellites Can Affect Our Lives," *National Geographic Magazine*, December 1957, p. 791.

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about the shape and crust of the earth, the nature of the sun's ultra-violet rays, and data to facilitate more accurate measurement of distances on the earth's surface.

The early space projects will prepare the way not only for man's venture into outer space but also for other projects of great material benefit to man. In addition to weather forecasting or control, there is the possibility that power can be generated from solar energy to illuminate large portions of the earth or to supply pools of atomic oxygen to fuel aircraft traversing outer space. Space offers also an unequaled laboratory for discovering new medicaments, because it affords variable temperatures and a near-perfect vacuum free of impurities. A more immediate prospect is discovery of means of eliminating atmospheric disturbances and greatly extending the range of broadcasting stations. Such developments are only samples of the manifold benefits likely to be obtained ultimately from exploration of outer space.

Need for Regulation of Outer Space

ASTRONAUTICS, or the science of space travel, occupies today much the same position as that of aeronautics at the beginning of the century. Then, as now, a large part of the requisite technical information had been obtained and was ready to be applied. Then, as today, there were almost no rules or customs among nations to govern the new developments.⁵ It is obvious now that the further nations proceed independently in space propulsion and exploration, the more difficult it will be to avoid or settle misunderstandings.

Laws of more than 80 countries currently make reference to "air space" and "atmosphere," and a score of treaties employ the terms, but the terms themselves are nowhere defined. The basic American statute on the subject, the Air Commerce Act of 1926, uses "air space" in typical fashion; it declares the "complete and exclusive

⁵ One of the conventions adopted at the first Hague peace conference in 1899, while the dirigible was still in an experimental stage and four years before the first airplane flight at Kitty Hawk, prohibited "the discharge of projectiles and explosives from balloons or by other new methods of similar nature." The convention expired after five years, and it proved impossible to obtain agreement to its renewal at the second Hague conference in 1907.

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national sovereignty" of the United States "in the air space above the United States." As a result of such laws and treaties, earth satellites technically impinge on the sovereignty of numerous countries each time they circle the globe.

INTERNATIONAL CONVENTIONS ON USE OF AIR SPACE

International law on air space dates back to 1919. Prior to that year, there was no agreement among nations or legal authorities on the question of air space sovereignty. Some international lawyers had urged between 1900 and 1910 that the air, like the sea, be made free to commerce and travel. However, bombing from airplanes and dirigibles during World War I prompted nations to claim jurisdiction over the air space above them. The Paris Convention for the Regulation of Air Navigation, drawn up during the peace conference in 1919, declared that "Every power has complete and exclusive sovereignty over the air space above its territory." The parties to the convention agreed to accord freedom of innocent passage to the aircraft of other signatories in time of peace, but that provision was not generally observed and it was dropped when a new Convention on International Civil Aviation was negotiated at Chicago in 1944.⁶

The Chicago convention reaffirmed the concept of absolute state sovereignty over super-adjacent air space. Seventy-two countries ratified the convention. Although the Soviet Union was not a party, the present Soviet air codes indicate that the U.S.S.R. subscribes to this now generally accepted principle of international law.

The principle of untrammelled national sovereignty extending "up to the sky" has been attacked as foolish, impractical, and dangerous. Arthur C. Clarke wrote recently:

No nation could claim the space above it to an unlimited extent. If it did, we would have the situation where *all* the larger countries on earth might make simultaneous claim to a considerable part of the cosmos. If anyone doubts that, let him look at a terrestrial globe and see how much of the universe passes above the frontiers of, say, the United States or the Soviet Union each time the earth turns on its axis.⁷

⁶ The United States, which signed but did not ratify the 1919 convention, ratified the Chicago convention on Jan. 22, 1945. In practice, flights of aircraft over the territory of foreign countries, particularly where landing rights are involved, are regulated by bilateral treaties or other mutual agreements.

⁷ Arthur C. Clarke, *The Making of a Moon* (1958), p. 167.

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Andrew Haley, president of the International Astronautical Federation and general counsel of the American Rocket Society, has said that as a practical matter astronautical progress requires international cooperation. Rocket aircraft, the point-to-point earth rocket ship, and the space ship capable of freely maneuvering in outer space will each need navigation aids, anti-collision devices, secondary radar, communications systems, meteorological services.

Even while nations are no further along in space flight than the satellite stage, there is need for international rules. Agreements must be worked out to avoid collisions between satellites and to avoid confusion over use of radio frequencies. Consideration must be given to the question of responsibility for damage done by a satellite which falls back to earth without disintegrating. The right of a nation to claim recoverable capsules also deserves attention.

In the very near future both the United States and the Soviet Union will want to launch satellites containing photographic equipment. Some persons have said that such an undertaking demands the immediate discussion of certain legal and political questions affecting use of outer space. They point out that the equipment used to photograph meteorological formations could be used to ascertain the location of important military and industrial installations within the territory of a potential enemy. Nations should not wait, it has been said, until these Janus-like vehicles are placed in orbit before acting to avoid possibly disastrous repercussions.

Most scientists agree that the International Geophysical Year, whose activities include the American and Soviet earth satellite projects, provides an excellent example of the benefits resulting from universal cooperation. Indeed, it can be strongly argued that nations have conceded that there is an upper limit in space beyond which national sovereignty should give way to international freedom. Haley has asserted that "By agreeing to support actively the satellite program, the more than 50 nations participating in I.G.Y. also agreed to the legal validity of the project."⁸

Satellites launched in connection with the information-

⁸ Speech by Andrew G. Haley at annual meeting of American Rocket Society, New York, Dec. 4, 1958.

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pooling agreements of I.G.Y. have no direct military character. The world would probably be outraged if any satellite on a strictly peaceful mission were to be shot from the sky. Soon, however, the leading astronautical powers will possess, if they do not already possess, the ability to make effective any claim to air space sovereignty against a military satellite. It is partly to avoid an attempt to make good what would be in effect a claim to ownership of the cosmos that proposals now are being advanced to limit use of outer space exclusively to peaceful purposes.

PROPOSALS TO APPLY RULE OF HIGH SEAS TO SPACE

International lawyers, scientists, and an increasing number of world political leaders have been seeking solutions to problems likely to attend the exploration of space. Many of them are convinced that outer space should be internationalized. National sovereignty might continue to be recognized in the air space above the territory and the coastal waters of a nation, but no part of "outer space" can in good sense be considered a monopoly of any one nation.

Development of the law of the high seas suggests some of the difficulties apt to be encountered in shaping agreement on where the boundary between air space and outer space lies. Growth of the maritime nations and maritime commerce gave rise to a series of claims to national sovereignty over vast areas of the high seas. Venice claimed sovereignty over the Adriatic, as did Genoa over the Ligurian Sea, and broad claims were made later by Denmark and Sweden, England, France, and Holland. Such claims reached their zenith in 1494 in the Treaty of Tordesillas, whereby Spain and Portugal sought to divide sovereignty over the Atlantic, Pacific, and Indian oceans.⁹

It was to refute the claims of Spain and Portugal that Grotius in 1609 gave classic exposition to the doctrine of freedom of the seas. Stated in simplest terms, it provides that the open sea is not, and cannot be, under the sovereignty of any state. The high seas must be considered open to navigation and innocent use by the merchant vessels of all nations in time of peace and of all neutral nations in time of war. This principle became widely recognized as a basic rule of international law during the 18th cen-

⁹ Maritime Law Association of the United States, *Report of Committee on Territorial Waters and United Nations Activities* (1957), p. 4148.

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tury and firmly established during the 19th century. Although the advent of submarine warfare in the 20th century interposed obstacles to its practical observance in both of the great world conflicts, its full application in peacetime was not questioned.

There never has been universal agreement on the width of territorial waters. Early attempts to define the zone over which a nation could exercise sovereignty were based on the power of a state to control its sea approaches from the land. A Dutch authority, Bynkershoek, declared in 1703 that the test of that power was the range of a cannon, then regarded as one marine league or three nautical miles.¹⁰ The United States and most of the principal maritime nations still hold to the three-mile limit. The Soviet Union insists that its territorial waters extend 12 miles from the coast, while certain South American countries, anxious to reserve adjacent waters for their fishing enterprises, claim sovereignty over bands of the high seas extending 200 miles from their shores.

Persons interested in the freedom of outer space hope for early and general international agreement on a boundary between air space and outer space. They think the world cannot safely endure a long period of uncertainty on the question like that required to establish freedom of the seas. Protracted controversies over the frontier between air space and outer space, comparable to the repeated disputes about the width of territorial waters, presumably would be equally dangerous.

DISTINCTION BETWEEN AIR SPACE AND OUTER SPACE

Deputy Secretary of Defense Donald A. Quarles recently proposed a method of differentiating between air space and outer space:

I suggest we distinguish [outer space] from air space by noting that craft in outer space will be so little influenced by the atmosphere in the near vacuum in which they move that their motions will closely follow Newton's and Kepler's laws; whereas aircraft will carry wings which depend on aerodynamic forces, not to mention the fact that most of the aircraft have air-breathing engines that depend on the oxygen in the air for combustion of fuels.¹¹

Secretary Quarles was not at the time discussing legal

¹⁰ See "Territorial Waters and the High Seas," *F.R.R.*, 1955 Vol. II, pp. 685-687.

¹¹ Speech by Donald A. Quarles to Wings Club, New York, Nov. 18, 1957.

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problems, but many space authorities have taken the position that national sovereignty should end at that point in space where the air is so thin that it will no longer support winged aircraft. Haley asserts that such a boundary should be fixed at about 275,000 feet or 52 miles. Because he bases that proposed boundary on the calculations of a leading rocket expert, Theodore von Karman, Haley calls it the Karman Line.

The chief legal officer of the United Nations, Oscar Schachter, has agreed that some practical scientific method should be employed to distinguish between air space and outer space for jurisdictional purposes. It is generally thought, however, that more information is needed to establish with certainty a boundary based on physical laws. Schachter has stressed the point that, in any case, "A national state would not exercise jurisdiction over the outer space, but only over the ships flying its flag and the persons and goods aboard such ships."

Many customs, principles, and precedents of international law do not apply to problems relating to outer space. International lawyers disagree on what must be done to establish title to land on the earth not belonging to any other state. A few contend that a country can assert ownership the minute some national symbol is planted on the unclaimed territory. The more generally held view is that discovery confers only an inchoate or incomplete title and that occupation and administration are necessary before sovereignty can be legally claimed. Neither of these theories, most space lawyers believe, is applicable in the case of the moon. A British authority, discussing the law of possession as applied to territory in outer space, wrote recently:

The law of discovery that prevailed when Columbus, Magellan, Vasco da Gama, and the Cabots sailed the seas is certainly not applicable. From the end of the Middle Ages the law of discovery has passed through successive stages. At any given time, relevant legal systems have been applied. The system of law applicable to the areas above the earth's surface is that system specially provided in the 20th century through the medium of law-making treaties.¹²

As a step toward settlement of outer-space legal questions "through the medium of law-making treaties," interested groups have set up committees to study the pertinent

¹² Michael Aaronson, "The Legal Control of Space," *The Listener*, Dec. 19, 1957, p. 1020.

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problems. The American Bar Association last year created a new Space Law Committee, headed by David F. Maxwell, A.B.A. president in 1956. The Eighth Congress of the International Astronautical Federation, meeting at Barcelona, Spain, in October 1957, authorized appointment of a committee, including Americans, Russians, and members of other nationalities, to define "the jurisdiction of air law and of space law."¹³ It has been noted that the U.N.-sponsored International Law Commission is authorized to draft treaties on "subjects which have not yet been regulated by international law." However, it is unlikely to go into questions of space law for some time, for it is now fully occupied on attempts to codify the law of the sea.

Soviet jurists and scientists have taken part in most of the recent international conferences on outer space problems, and such problems are frequently examined in Soviet journals. One recent article discussed many of the legal uncertainties connected with outer space and some of the proposed solutions. Its author concluded that "Jurists face insoluble problems for the time being," but that it is "quite clear that all these questions, in spite of their complexity, can be solved if there is a positive approach by the negotiating parties and if artificial satellites are utilized only for peaceful purposes."¹⁴

Outer Space and the United Nations

FOUR DAYS after President Eisenhower suggested to Soviet Premier Bulganin that the nations of the world "agree that outer space should be used only for peaceful purposes," Secretary of State Dulles elaborated on the proposal. Addressing the National Press Club in Washington, Jan. 16, he advocated formation of an international commission, "preferably under the auspices of the United Nations," to administer "an effective, all-inclusive, dependable system of supervision" which would assure that outer space would be used "in the interests of science and humanity and not in the interests of war." Dulles stressed that

¹³ Known as the Cooper committee, the group bears the name of its chairman, John Cobb Cooper, former director of the Institute of International Air Law at McGill University.

¹⁴ A. Shternfel'd, "To Whom Does Outer Space Belong?" *Izkusstvennye sputnikhi zemli* (Artificial Satellites of Earth), 1956, pp. 174-177.

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"The time to move is now, in the infancy of this art of penetrating and reaching outer space." He pointed out that the opportunity was "almost staggering in its possible implications—its implications if we do it, and its tragic implications if we do not do it."

Calls for international control of outer space pre-date launching of the first earth satellite by Soviet Russia last October. President Eisenhower said in his State of the Union message a year ago, Jan. 10, 1957, that the United States was willing to enter into an agreement to control outer space missile and satellite development. The U.N. Disarmament Subcommittee discussed in London last summer possible inspection systems to assure that "objects sent through outer space" would be employed for strictly peaceful or scientific purposes.

The most recent proposals of the President and the Secretary of State were considered significant as evidence of willingness to lift the matter of space control out of the general disarmament negotiations. They seemed to look to control of satellites and ballistic missiles as a first step on the way to a more comprehensive disarmament agreement. But the Russians apparently were not willing to adopt that approach.

Some type of international commission or tribunal presumably would have to be set up to oversee the observance of any world-wide rules on use of outer space and to mediate or judge controversies over alleged violations. Commenting on this possibility, James Avery Joyce wrote in the *Saturday Review of Literature* on Jan. 4, 1958:

This would plainly indicate some sort of United Nations "sovereignty" being conferred on all spacecraft or other space objects being projected into outer space. A fascinating prospect is opening up in the U.N. as a source of universal sovereign rights and as a public trustee for the human race.

The U.N. General Assembly may discuss outer space controls when it convenes next autumn. Sir Leslie K. Munro of New Zealand, current Assembly president, suggested on Jan. 31 that the United Nations sponsor a conference of scientists and diplomats "within the next two or three months" to study control of outer space. Munro had indicated earlier why he thought solution of the problems of the space age should be sought through the world

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organization. In a letter in the *New York Times* of Dec. 10, 1957, he asserted that the purposes and principles of the United Nations were the very purposes and principles which must govern use of outer space. The United Nations, moreover, was peculiarly equipped to provide small powers with an opportunity to be heard. "In keeping with the growing tendency of international sharing of advances in the scientific field, a tendency which has been accentuated in the field of atomic energy and in the arrangements adopted for the International Geophysical Year, achievements relating to outer space must be shared by all nations."

MILITARY FACTOR AS BARRIER TO EARLY AGREEMENT

A fundamental obstacle to agreement on space controls lies in the fact that the rockets employed to propel satellites into orbit are basically weapons. Nikita Khrushchev said on Jan. 22, in advance of Bulganin's reply to the President, that the Soviet Union would not consider Eisenhower's proposal to "detach from the general problem of disarmament the single issue of the intercontinental missile." Until some agreement can be reached on the scope of a disarmament agreement, there appears little hope of establishing a U.N. commission to control use of outer space.

It has been argued that the Soviet Union would be unwilling to yield full control over an important weapon in which it apparently holds a lead. Russian intransigency in the United Nations could be linked, from 1946 to 1953, to a determination to catch up with the United States in nuclear weapons. Having caught up—and perhaps pulled ahead—the Russians would have little to gain from a system of international control of outer space.

The clamor here to match the Soviet Union in missile and satellite development has produced, in turn, wide disagreement among high officials on how the American space effort should be organized. Until Congress and the administration settle the tangled conflicts involved in this question, little progress toward agreement on a world-wide program for exploration and control of outer space can be expected.

It may be, in fact, that second thoughts will counsel a go-slow approach on the part of this country. The transcript of testimony given at a closed hearing of a House Foreign Affairs subcommittee, released Feb. 13, disclosed

that Loftus Becker, State Department legal adviser, had opposed any immediate action on proposals for a special conference on space regulation or for formulation now of rules on the subject. It was Becker's opinion that more information about outer space was needed before rules for its control could be laid down.¹⁵

OUTLOOK FOR EVENTUAL COOPERATION IN OUTER SPACE

Proponents of early action, at least to regulate navigation in outer space, contend that failure to reach a disarmament agreement is not a valid reason for delay. Michael Aaronson has pointed out that the fact that airplanes can inflict vast destruction did not prevent the conferees at Paris and Chicago from considering rules of navigation in air space.¹⁶ Such rules were formulated for application during periods of peace and can help to preserve peace.

Cooperative efforts in space exploration seem to be precluded now by the secrecy attending missile development. But in the course of exploring space to gain knowledge and test skills, it may be possible to work out certain informal rules, such as a tacit agreement not to interfere with one another's peaceful projects. In time, nations may be able to cover by treaty those areas not yet regulated by custom.

It may be noted, by analogy, that most leading powers took a wait-and-see attitude toward control of the Antarctic continent.¹⁷ Now a definite move away from individual national claims appears to have been stimulated by International Geophysical Year activities in that region. British Prime Minister Harold Macmillan said on Feb. 12, at the conclusion of his recent visit to Australia, that Antarctica should be a free zone of scientific collaboration. The British are believed to favor placing the continent under the jurisdiction of an international commission made up of nations with a direct interest in the area. Such nations would be required to renounce any territorial claims. Military installations would be barred.¹⁸

¹⁵ Among regulations eventually necessary, Becker said, would be rules to protect people under space vehicles, to channel radio frequencies for space vehicles, to govern navigation, and to cover marriages and other legal relationships in outer space.

¹⁶ Michael Aaronson, "The Legal Control of Space," *The Listener*, Dec. 19, 1957, p. 1019.

¹⁷ See "Antarctic Claims," *E.R.R.*, 1949 Vol. II, pp. 786-791.

¹⁸ This country never has made territorial claims in Antarctica, but a House subcommittee which visited the region last year has reportedly recommended to the President that it now do so. Rep. Oren Harris (D-Ark.), subcommittee chairman, said on Feb. 17 that he opposed putting the whole continent under international control.

Control of Outer Space

Some great discovery through space flight might produce strong demand for a similar joint undertaking with regard to outer space—if not a governing arrangement, at least an international pooling of brains and facilities to speed up conversion of new knowledge into material benefits. Or cooperation might come about in quite a different way. Asked recently if he thought the United States and the Soviet Union might get together to explore space, S. Fred Singer, designer of the Farside rocket which broke all records last autumn by attaining an altitude of around 2,700 miles, replied:

I doubt very much if there is going to be much international collaboration in space-flight projects within the next two to five years, simply because these are being done with military rockets. . . . But I hope that the real exploration of the solar system by man can be done on a basis of some international cooperation. And I think the chances are good because the rocket vehicles used for this purpose will become so large that their military significance will be negligible.¹⁹

The spirit of cooperation invoked by the International Geophysical Year may be hard to squelch or ignore when the project officially ends on Dec. 31, 1958. It has been suggested that once man experiences the excitement and sense of imminent achievement that the space frontier holds, some of his attention may be diverted from the quarrels and conflicts that beset terrestrial affairs. He may find in space exploration the long-sought "moral equivalent of war" that William James proposed.²⁰

¹⁹ Interview in *U.S. News & World Report*, Jan. 17, 1958, pp. 73-74.

²⁰ James's suggested "moral equivalent" was "a conscription of the whole youthful population to form for a certain number of years a part of the army enlisted against Nature." Under such a conscription, he wrote, no one would remain blind "to man's real relations to the globe he lives on and to the . . . hard foundations of his higher life." The only thing needed was "to inflame the civic temper as past history has inflamed the military temper."—William James, *The Moral Equivalent of War* (pamphlet published by Carnegie Endowment for International Peace, 1910).



